

In the Claims

1. (Currently Amended) A method comprising:
determining randomly distributed features in an object;
determining a probability density function associated with the object;
compressing data representing the randomly distributed features, wherein
the compressing is based in part on the probability density function;
encoding the compressed data with a signature; and
creating a label ~~that includes~~ comprising the object and the encoded data.
2. (Currently Amended) The method as recited in Claim 1, wherein
compressing the data ~~includes~~ additionally comprises:
~~determining a probability density function associated with the object;~~
determining vectors associated with the randomly distributed ~~attributes~~
features based, at least in part, on the probability density function; and
encoding the vectors using an arithmetic coding algorithm.
3. (Original) The method as recited in Claim 2, wherein encoding the
vectors using the arithmetic coding algorithm includes determining a path for
connecting a portion of the vectors within a fixed amount of data.
4. (Original) The method as recited in Claim 2, wherein the randomly
distributed features are fibers that are randomly positioned in the object.

1 5. (Original) The method as recited in Claim 4, wherein the probability
2 density function represents a probability that fibers in the particular region are
3 illuminated by a light source.

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5 6. (Original) The method as recited in Claim 4, wherein the probability
6 density function is derived based, at least in part, on the length of the fibers.

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8 7. (Original) The method as recited in Claim 4, wherein each vector
9 represents the end points of two fibers.

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11 8. (Original) The method as recited in Claim 1, wherein the data is
12 encoded with a private key.

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14 9. (Original) The method as recited in Claim 1, wherein the label is a
15 certificate of authenticity configured to be self-authenticated and wherein the
16 object is an authentication object included in the certificate of authenticity.

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18 10. (Original) The method as recited in Claim 1, wherein the encoded
19 data is included in the label as a barcode.

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21 11. (Original) The method as recited in Claim 1, further comprising:
22 determining textual data that includes a string of characters;
23 hashing the textual data with an algorithm;
24 encrypting the compressed data using the hashed textual data; and
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1 including the textual data in the label.

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3 12. (Original) The method as recited in Claim 11, wherein the algorithm
4 is a cryptographically secure hash algorithm.

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6 13. (Original) The method as recited in Claim 11, wherein the algorithm
7 is an SHA1 cryptographical algorithm.

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9 14. (Original) One or more computer-readable memories containing
10 instructions that are executable by a processor to perform the method recited in
11 Claim 1.

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13 15. (Currently Amended) A system comprising
14 an issuer configured to determine randomly distributed features in an
15 authentication object and to compress data representing the randomly distributed
16 features, the issuer being further configured to encode the compressed data with a
17 signature and to create a label that includes the authentication object and the
18 encoded data data;

19 wherein the issuer is further configured to determine a probability density
20 function associated with the authentication object, to determine vectors associated
21 with the randomly distributed attributes based, at least in part, on the probability
22 density function, and to encode a portion of the vectors as a path by applying an
23 arithmetic coding algorithm.

1 16. (Cancel)

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3 17. (Original) The system as recited in Claim 15, wherein the issuer is
4 further configured to encode the compressed data with a private key.

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6 18. (Original) The system as recited in Claim 15, wherein the issuer is
7 further configured to include a barcode with the encoded data in the label.

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9 19. (Original) The system as recited in Claim 15, wherein the issuer is
10 further configured to determine textual data that includes a string of characters and
11 to hash the textual data with an algorithm.

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13 20. (Original) The system as recited in Claim 19, wherein the issuer is
14 further configured to encrypt the compressed data using the hashed textual data
15 and to include the textual data in the label.

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17 21. (Original) The system as recited in Claim 15, further comprising:
18 a verifier configured to decode the data representing the randomly
19 distributed features in the label and to authenticate the label by comparing the
20 decoded data with the data of the actual randomly distributed features determined
21 from the authentication object.

1 22. (Currently Amended) A label comprising:
2 an authentication object including randomly distributed features; and
3 encoded information associated with the authentication object, the
4 information being encoded with a signature and including compressed data
5 representing the randomly distributed features in the authentication object,
6 wherein the data in the encoded information is compressed by:

7 determining a probability density function associated with the
8 authentication object;

9 determining vectors associated with the randomly distributed
10 attributes based, at least in part, on the probability density function; and

11 encoding the vectors using an arithmetic coding algorithm;

12 wherein the label is self-authenticated by comparing the compressed data in
13 the encoded information and the data representing the randomly distributed
14 features obtained by analyzing the authentication object.

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16 23. (Cancel)

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18 24. (Original) The label as recited in Claim 22, wherein encoded
19 information is included in the label as a barcode.

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21 25. (Original) The label as recited in Claim 22, wherein encoded
22 information is encoded using a private key.

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24 26. (Original) The label as recited in Claim 22, further comprising:
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1 textual data that includes a string of characters, wherein the compressed
2 data is encrypted using the textual data.

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4 27. (Original) The label as recited in Claim 26, wherein compressed data
5 is encrypted by:

6 hashing the textual data with an algorithm; and

7 encrypting the compressed data using the hashed textual data.

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9 28. (Currently Amended) An apparatus comprising:
10 means for determining randomly distributed features in an authentication
11 object;

12 means for determining a probability density function associated with the
13 authentication object;

14 means for compressing data representing the randomly distributed features,
15 wherein the compressing is based in part on the probability density function;

16 means for encoding the data with a signature; and

17 means for creating a label that includes the authentication object and the
18 encoded data.

19
20 29. (Original) The apparatus as recited in Claim 28, further comprising
21 means for incorporating fibers in the authentication object as the randomly
22 distributed features.

1 30. (Currently Amended) The apparatus as recited in Claim 28, further
2 comprising:

3 ~~means for determining a probability density function associated with the~~
4 ~~authentication object;~~

5 means for determining vectors associated with the randomly distributed
6 ~~attributes/features~~ based, at least in part, on the probability density function; and

7 means for encoding the vectors using an arithmetic coding algorithm.
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9 31. (Original) The method as recited in Claim 28, further comprising:

10 means for determining textual data that includes a string of characters;

11 means for hashing the textual data with an algorithm;

12 means for encrypting the compressed data using the hashed textual data;

13 and

14 means for including the textual data in the label.
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16 32. (Original) The apparatus as recited in Claim 28, further comprising:

17 means for authenticating the label by comparing encoded data with the data
18 associated with the randomly distributed features in the authentication object.
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